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=> s Rs-AFP2

L1 181 RS-AFP2

=> s l1 and hydrophobic residue

L2 19 L1 AND HYDROPHOBIC RESIDUE

=> d l2 ti abs ibib tot

L2 ANSWER 1 OF 19 USPATFULL on STN

TI Antifungal proteins

AB Antifungal proteins which are analogues of the **Rs-AFP2**
protein and contain particular mutations in their amino acid sequence.
The mutated proteins possess enhanced salt-tolerant antifungal activity.
The proteins are useful for combating fungal diseases in agricultural,
pharmaceutical or preservative applications.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2002:274364 USPATFULL

TITLE: Antifungal proteins

INVENTOR(S): Rees, Sarah Bronwen, Bracknell, UNITED KINGDOM
De Samblanx, Genoveva Wivina, Heverlee, BELGIUM
Broekaert, Willem Frans, Dilbeek, BELGIUM

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2002152498	A1	20021017
APPLICATION INFO.:	US 2001-6252	A1	20011204 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 1999-77951, filed on 11 Mar 1999, GRANTED, Pat. No. US 6372888		

	NUMBER	DATE
PRIORITY INFORMATION:	GB 1995-25474	19951213
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	HALE AND DORR, LLP, 60 STATE STREET, BOSTON, MA, 02109	
NUMBER OF CLAIMS:	10	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	8 Drawing Page(s)	
LINE COUNT:	1453	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L2 ANSWER 2 OF 19 USPATFULL on STN

TI Antifungal proteins

AB Antifungal proteins which are analogues of the **Rs-AFP2**

protein and contain particular mutations in their amino acid sequence. The mutated proteins possess enhanced salt-tolerant antifungal activity. The proteins are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2002:81610 USPATFULL
 TITLE: Antifungal proteins
 INVENTOR(S): De Samblanx, Genoveva Wivina, Heverlee, BELGIUM
 Broekaert, Willem Frans, Dilbeek, BELGIUM
 Rees, Sarah Bronwen, Bracknell, UNITED KINGDOM
 PATENT ASSIGNEE(S): Zeneca Limited, London, UNITED KINGDOM (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6372888	B1	20020416
	WO 9721814		19970619
APPLICATION INFO.:	US 1999-77951		19990311 (9)
	WO 1996-GB3065		19961212
			19990311 PCT 371 date

	NUMBER	DATE
PRIORITY INFORMATION:	GB 1995-25474	19951213
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Carlson, Karen Cochrane	
ASSISTANT EXAMINER:	Robinson, Hope A.	
LEGAL REPRESENTATIVE:	Hale and Dorr LLP	
NUMBER OF CLAIMS:	5	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	9 Drawing Figure(s); 8 Drawing Page(s)	
LINE COUNT:	1425	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L2 ANSWER 3 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
 TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
 AN AAW19616 Protein DGENE
 AB This polypeptide comprises radish antifungal protein 2 (**Rs-AFP2**). Novel potent antifungal proteins (see AAW26371-90) based on **Rs-AFP2** contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW19616 Protein DGENE
 TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
 INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
 PATENT ASSIGNEE: (ZENE) ZENECA LTD.
 PATENT INFO: WO 9721814 A1 19970619 39p
 APPLICATION INFO: WO 1996-GB3065 19961212
 PRIORITY INFO: GB 1995-25474 19951213

DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Radish antifungal protein 2 (**Rs-AFP2**).

L2 ANSWER 4 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate
fungus-resistant plants or as therapeutic or preservative agents
AN AAW26390 Protein DGENE
AB This polypeptide comprises a mutant isoform of radish antifungal protein
2 (**Rs-AFP2**) (see also AAW19616). Novel potent
antifungal proteins (see AAW26371-90) are based on **Rs-**
AFP2 and contain at least 1 mutation selected from a basic
residue at positions 9 or 39, and a **hydrophobic residue**
at positions 5 or 16. Proteins containing Gln5Met (see AAW26379),
Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg
plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA
clone encoding **Rs-AFP2** preprotein can be modified by
recombinant DNA methods to allow expression of mutant isoforms in yeast
as mating factor alpha 1 fusion proteins. The **Rs-AFP2**
mutants have enhanced salt tolerant antifungal activity, especially when
expressed in plant tissue where that may have curative as well as
protective effects. They are useful for combating fungal diseases in
agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26390 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to
generate fungus-resistant plants or as therapeutic or
preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE) ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Antifungal **Rs-AFP2** mutant
(Q5E/P7S/G16M/R27N/K30G/V39I/A42Y/K44R).

L2 ANSWER 5 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate
fungus-resistant plants or as therapeutic or preservative agents
AN AAW26389 Protein DGENE
AB This polypeptide comprises a mutant isoform of radish antifungal protein
2 (**Rs-AFP2**) (see also AAW19616). Novel potent
antifungal proteins (see AAW26371-90) are based on **Rs-**
AFP2 and contain at least 1 mutation selected from a basic
residue at positions 9 or 39, and a **hydrophobic residue**
at positions 5 or 16. Proteins containing Gln5Met (see AAW26379),
Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg
plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA
clone encoding **Rs-AFP2** preprotein can be modified by
recombinant DNA methods to allow expression of mutant isoforms in yeast
as mating factor alpha 1 fusion proteins. The **Rs-AFP2**
mutants have enhanced salt tolerant antifungal activity, especially when
expressed in plant tissue where that may have curative as well as
protective effects. They are useful for combating fungal diseases in
agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26389 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to
generate fungus-resistant plants or as therapeutic or
preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE) ZENECA LTD.

PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Antifungal **Rs-AFP2** mutant
(Q5M/P7S/R27N/K30G/V39I/A42Y/K44R).

L2 ANSWER 6 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate
fungus-resistant plants or as therapeutic or preservative agents
AN AAW26388 Protein DGENE
AB This polypeptide comprises a mutant isoform of radish antifungal protein
2 (**Rs-AFP2**) (see also AAW19616). Novel potent
antifungal proteins (see AAW26371-90) are based on **Rs-**
AFP2 and contain at least 1 mutation selected from a basic
residue at positions 9 or 39, and a **hydrophobic residue**
at positions 5 or 16. Proteins containing Gln5Met (see AAW26379),
Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg
plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA
clone encoding **Rs-AFP2** preprotein can be modified by
recombinant DNA methods to allow expression of mutant isoforms in yeast
as mating factor alpha 1 fusion proteins. The **Rs-AFP2**
mutants have enhanced salt tolerant antifungal activity, especially when
expressed in plant tissue where that may have curative as well as
protective effects. They are useful for combating fungal diseases in
agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26388 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to
generate fungus-resistant plants or as therapeutic or
preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE)ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Antifungal **Rs-AFP2** mutant
(Q5E/P7S/G9R/R27N/K30G/V39R/A42Y/K44R).

L2 ANSWER 7 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate
fungus-resistant plants or as therapeutic or preservative agents
AN AAW26387 Protein DGENE
AB This polypeptide comprises a mutant isoform of radish antifungal protein
2 (**Rs-AFP2**) (see also AAW19616). Novel potent
antifungal proteins (see AAW26371-90) are based on **Rs-**
AFP2 and contain at least 1 mutation selected from a basic
residue at positions 9 or 39, and a **hydrophobic residue**
at positions 5 or 16. Proteins containing Gln5Met (see AAW26379),
Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg
plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA
clone encoding **Rs-AFP2** preprotein can be modified by
recombinant DNA methods to allow expression of mutant isoforms in yeast
as mating factor alpha 1 fusion proteins. The **Rs-AFP2**
mutants have enhanced salt tolerant antifungal activity, especially when
expressed in plant tissue where that may have curative as well as
protective effects. They are useful for combating fungal diseases in
agricultural, pharmaceutical or preservative applications.
ACCESSION NUMBER: AAW26387 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to

generate fungus-resistant plants or as therapeutic or preservative agents

INVENTOR: Broekaert W F; De Samblanx G W; Rees S B

PATENT ASSIGNEE: (ZENE) ZENECA LTD.

PATENT INFO: WO 9721814 A1 19970619 39p

APPLICATION INFO: WO 1996-GB3065 19961212

PRIORITY INFO: GB 1995-25474 19951213

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: 1997-332785 [30]

DESCRIPTION: Antifungal **Rs-AFP2** mutant
(Q5E/P7S/R27N/K30G/V39R/A42Y/K44R).

L2 ANSWER 8 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN

TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents

AN AAW26386 Protein DGENE

AB This polypeptide comprises a mutant isoform of radish antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26386 Protein DGENE

TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents

INVENTOR: Broekaert W F; De Samblanx G W; Rees S B

PATENT ASSIGNEE: (ZENE) ZENECA LTD.

PATENT INFO: WO 9721814 A1 19970619 39p

APPLICATION INFO: WO 1996-GB3065 19961212

PRIORITY INFO: GB 1995-25474 19951213

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: 1997-332785 [30]

DESCRIPTION: Antifungal **Rs-AFP2** mutant
(Q5E/P7S/G9R/R27N/K30G/V39I/A42Y/K44R).

L2 ANSWER 9 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN

TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents

AN AAW26385 Protein DGENE

AB This polypeptide comprises a mutant isoform of radish antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as

protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26385 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE)ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Radish antifungal protein 2 mutant (delQ1,Q5E/P7S/G16M/K30G).

L2 ANSWER 10 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
AN AAW26384 Protein DGENE
AB This polypeptide comprises a mutant isoform of radish antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26384 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE)ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Radish antifungal protein 2 mutant (delQ1,Q5M/P7S/K30G).

L2 ANSWER 11 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
AN AAW26383 Protein DGENE
AB This polypeptide comprises a mutant isoform of radish antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2**

mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26383 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE) ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Radish antifungal protein 2 mutant (delQ1,Q5E/P7S/G9R/K30G/V39R).

L2 ANSWER 12 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
AN AAW26382 Protein DGENE
AB This polypeptide comprises a mutant isoform of radish antifungal protein 2 (**Rs-AFP2**). (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26382 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE) ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Radish antifungal protein 2 mutant (delQ1,Q5E/P7S/K30G/V39R).

L2 ANSWER 13 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
AN AAW26381 Protein DGENE
AB This polypeptide comprises a mutant isoform of radish antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA

clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26381 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE)ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Radish antifungal protein 2 mutant (delQ1,Q5E/P7S/G9R/K30G).

L2 ANSWER 14 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
AN AAW26375 Protein DGENE
AB This polypeptide comprises a Gln5Glu, Gly16Met, Arg27Asn mutant of radish antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26375 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE)ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Radish antifungal protein 2 mutant (Q5E/G16M/R27N).

L2 ANSWER 15 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
AN AAW26374 Protein DGENE
AB This polypeptide is Gln5Glu, Arg27Asn mutant of radish antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue**

at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (see AAW26380), Gly9Arg (see AAW26376), Val39Arg (see AAW26377) or Gly9Arg plus Val39Arg (see AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26374 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE)ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Radish antifungal protein 2 mutant (Q5M/R27N).

L2 ANSWER 16 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
AN AAW26373 Protein DGENE
AB This polypeptide is Gln5Glu, Gly9Arg, Arg27Asn, Val39Arg mutant of radish antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26373 Protein DGENE
TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
PATENT ASSIGNEE: (ZENE)ZENECA LTD.
PATENT INFO: WO 9721814 A1 19970619 39p
APPLICATION INFO: WO 1996-GB3065 19961212
PRIORITY INFO: GB 1995-25474 19951213
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: 1997-332785 [30]
DESCRIPTION: Radish antifungal protein 2 mutant (Q5E/G9R/R27N/V39R).

L2 ANSWER 17 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
AN AAW26372 Protein DGENE
AB This polypeptide comprises a Gln5Glu, Arg27Asn, Val39Arg mutant of radish

antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26372 Protein DGENE
 TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
 INVENTOR: Broekaert W F; De Samblanx G W; Rees S B
 PATENT ASSIGNEE: (ZENE) ZENECA LTD.
 PATENT INFO: WO 9721814 A1 19970619 39p
 APPLICATION INFO: WO 1996-GB3065 19961212
 PRIORITY INFO: GB 1995-25474 19951213
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 OTHER SOURCE: 1997-332785 [30]
 DESCRIPTION: Radish antifungal protein 2 mutant (Q5E/R27N/V39R).

L2 ANSWER 18 OF 19 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN
 TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
 AN AAW26371 Protein DGENE
 AB This polypeptide comprises a Gln5Glu, Gly9Arg, Arg27Asn mutant of radish antifungal protein 2 (**Rs-AFP2**) (see also AAW19616). Novel potent antifungal proteins (see AAW26371-90) are based on **Rs-AFP2** and contain at least 1 mutation selected from a basic residue at positions 9 or 39, and a **hydrophobic residue** at positions 5 or 16. Proteins containing Gln5Met (see AAW26379), Gly16Met (AAW26380), Gly9Arg (AAW26376), Val39Arg (AAW26377) or Gly9Arg plus Val39Arg (AAW26378) mutations are specifically claimed. A cDNA clone encoding **Rs-AFP2** preprotein can be modified by recombinant DNA methods to allow expression of mutant isoforms in yeast as mating factor alpha 1 fusion proteins. The **Rs-AFP2** mutants have enhanced salt tolerant antifungal activity, especially when expressed in plant tissue where that may have curative as well as protective effects. They are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

ACCESSION NUMBER: AAW26371 Protein DGENE
 TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents
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 APPLICATION INFO: WO 1996-GB3065 19961212
 PRIORITY INFO: GB 1995-25474 19951213
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 OTHER SOURCE: 1997-332785 [30]
 DESCRIPTION: Radish antifungal protein 2 mutant (Q5E/G9R/R27N).

L2 ANSWER 19 OF 19 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN

TI New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents.

AN 1997-332785 [30] WPIDS

AB WO 9721814 A UPAB: 19970723

New antifungal protein (A) is substantially homologous to the radish antifungal protein 2 sequence (**Rs-AFP2**), but contains at least one of the mutations: basic residue at positions 9 or 39, and **hydrophobic residue** at positions 5 or 16: QKLCQRPSGT WSGVCGNNNA CKNQCIRLEK ARHGSCNYVF PAHKCICYFPC (**Rs-AFP2**). Also new are: (1) antifungal peptides (B) comprising a sequence of at least 6 amino acids from (A), provided they include at least one of the mutations; (2) DNA (I) encoding (A) or (B); (3) a vector containing (I); and (4) a biological system, preferably a plant, containing (I) and expressing (A) or (B).

USE - Plants containing (I) have improved resistance to fungi (claimed). Compositions containing (A) or (B) can be used to control fungi or bacteria for agricultural, pharmaceutical or preservative purposes, e.g. treatment of Candida infections or as food additives, and for protection of crops or harvested produce. When applied to plants they may have curative as well as protective actions. Also contemplated is protection of plants by introducing into the soil or plant itself a microorganism able to express (A) or (B).

ADVANTAGE - Compared with **Rs-AFP2** itself, (A) and (B) have better activity in presence of high salt concentration (especially in plant tissue).

ACCESSION NUMBER: 1997-332785 [30] WPIDS

DOC. NO. NON-CPI: N1997-276169

DOC. NO. CPI: C1997-106837

TITLE: New active mutants of radish antifungal protein 2 - used to generate fungus-resistant plants or as therapeutic or preservative agents.

DERWENT CLASS: B04 C06 D16 D22 P13

INVENTOR(S): BROEKAERT, W F; DE, SAMBLANX G W; REES, S B

PATENT ASSIGNEE(S): (ZENE) ZENECA LTD; (BROE-I) BROEKAERT W F; (DSAM-I) DE SAMBLANX G W; (REES-I) REES S B

COUNTRY COUNT: 75

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 9721814	A1	19970619	(199730)*	EN	39
RW:	AT BE CH DE DK EA ES FI FR GB GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG				
W:	AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG US UZ VN				
AU 9711053	A	19970703	(199743)		
EP 866863	A1	19980930	(199843)	EN	
R:	AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE				
BR 9611948	A	19990525	(199926)		
CN 1204367	A	19990106	(200007)		
JP 2000502891	W	20000314	(200024)		39
AU 721482	B	20000706	(200038)		
US 6372888	B1	20020416	(200232)		
US 2002152498	A1	20021017	(200270)		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 9721814	A1	WO 1996-GB3065	19961212
AU 9711053	A	AU 1997-11053	19961212
EP 866863	A1	EP 1996-941778	19961212
		WO 1996-GB3065	19961212

BR 9611948	A	BR 1996-11948	19961212
CN 1204367	A	WO 1996-GB3065	19961212
JP 2000502891	W	CN 1996-198976	19961212
		WO 1996-GB3065	19961212
AU 721482	B	JP 1997-521853	19961212
US 6372888	B1	AU 1997-11053	19961212
		WO 1996-GB3065	19961212
US 2002152498	A1 Div ex	US 1999-77951	19990311
		US 1999-77951	19990311
		US 2001-6252	20011204

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 9711053	A Based on	WO 9721814
EP 866863	A1 Based on	WO 9721814
BR 9611948	A Based on	WO 9721814
JP 2000502891	W Based on	WO 9721814
AU 721482	B Previous Publ.	AU 9711053
	Based on	WO 9721814
US 6372888	B1 Based on	WO 9721814
US 2002152498	A1 Div ex	US 6372888

PRIORITY APPLN. INFO: GB 1995-25474 19951213

=> d his

(FILE 'HOME' ENTERED AT 14:22:14 ON 12 MAY 2004)

FILE 'MEDLINE, USPATFULL, DGENE, EMBASE, WPIDS, BIOSIS' ENTERED AT 14:22:36 ON 12 MAY 2004

L1 181 S RS-AFP2
L2 19 S L1 AND HYDROPHOBIC RESIDUE

=> s l2 and basic residue
L3 19 L2 AND BASIC RESIDUE

=> e broekaert, w/au
E1 1 BROEKAERT WILLIAM/AU
E2 1 BROEKAERT WILLIAM F/AU
E3 0 --> BROEKAERT, W/AU
E4 1 BROEKAET JOSE A C/AU
E5 1 BROEKAMP C L/AU
E6 1 BROEKAMP C L E/AU
E7 1 BROEKART W F/AU
E8 1 BROEKE C J T/AU
E9 4 BROEKE D/AU
E10 1 BROEKE D T/AU
E11 3 BROEKE D V D/AU
E12 2 BROEKE DIRK/AU

=> s e1
L4 1 "BROEKAERT WILLIAM"/AU

=> s e2
L5 1 "BROEKAERT WILLIAM F"/AU

=> d l4 ti abs ibib tot

L4 ANSWER 1 OF 1 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
TI The role of thionins in plant protection.
ACCESSION NUMBER: 1994:188309 BIOSIS

DOCUMENT NUMBER: PREV199497201309
TITLE: The role of thionins in plant protection.
AUTHOR(S): Bohlmann, Holger [Reprint author]; **Broekaert, William**
CORPORATE SOURCE: Inst. Pflanzenwissenschaften, ETH Zurich, LFW D.58, Universitaetsstrasse 2, CH-8092 Zurich, Switzerland
SOURCE: Critical Reviews in Plant Sciences, (1994) Vol. 13, No. 1, pp. 1-16.
CODEN: CRPSD3. ISSN: 0735-2689.
DOCUMENT TYPE: Article
General Review; (Literature Review)
LANGUAGE: English
ENTRY DATE: Entered STN: 2 May 1994
Last Updated on STN: 3 May 1994

=> d 15 ti abs ibib tot

L5 ANSWER 1 OF 1 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
TI Antimicrobial peptides from *Mirabilis jalapa* and *Amaranthus caudatus*: Expression, processing, localization and biological activity in transgenic tobacco.
AB The cDNAs encoding the seed antimicrobial peptides (AMPs) from *Mirabilis jalapa* (Mj-AMP2) and *Amaranthus caudatus* (Ac-AMP2) have previously been characterized and it was found that Mj-AMP2 and Ac-AMP2 are processed from a precursor preprotein and preproprotein, respectively (De Bolle et al., Plant Mol Biol 28:713-721 (1995) and 22:1187-1190 (1993), respectively). In order to study the processing, sorting and biological activity of these antimicrobial peptides in transgenic tobacco, four different gene constructs were made: a Mj-AMP2 wild-type gene construct, a Mj-AMP2 mutant gene construct which was extended by a sequence encoding the barley lectin carboxyl-terminal propeptide, a known vacuolar targeting signal (Bednarek and Raikhel, Plant Cell 3: 1195 - 1206 (1991)); an Ac-AMP2 wild-type gene construct; and finally, an Ac-AMP2 mutant gene construct which was truncated in order to delete the sequence encoding the genuine carboxyl-terminal propeptide. Processing and localization analysis indicated that an isoform of Ac-AMP2 with a cleaved-off carboxyl-terminal arginine was localized in the intercellular fluid fraction of plants expressing either wild-type or mutant gene constructs. M-jAMP2 was recovered extracellularly in plants transformed with Mj-AMP2 wild-type gene construct, whereas an Mj-AMP2 isoform with a cleaved-off carboxyl-terminal arginine accumulated intracellularly in plants expressing the mutant precursor protein with the barley lectin propeptide. The in vitro antifungal activity of the AMPs purified from transgenic tobacco expressing any of the four different precursor proteins was similar to that of the authentic proteins. However, none of the transgenic plants showed enhanced resistance against infection with either *Botrytis cinerea* or *Alternaria longipes*.

ACCESSION NUMBER: 1996:524738 BIOSIS
DOCUMENT NUMBER: PREV199699247094
TITLE: Antimicrobial peptides from *Mirabilis jalapa* and *Amaranthus caudatus*: Expression, processing, localization and biological activity in transgenic tobacco.
AUTHOR(S): De Bolle, Miguel F. C.; Osborn, Rupert W.; Goderis, Inge J.; Noe, Liesbet; Acland, David; Hart, Cliff A.; Torrekens, Sophie; Van Leuven, Fred; **Broekaert, William F.** [Reprint author]
CORPORATE SOURCE: F.A. Janssens Lab. Genetics, Katholieke Univ. Leuven, Willem de Croylaan 42, B-3111 Hevelee, Belgium
SOURCE: Plant Molecular Biology, (1996) Vol. 31, No. 5, pp. 993-1008.
CODEN: PMBIDB. ISSN: 0167-4412.
DOCUMENT TYPE: Article
LANGUAGE: English

ENTRY DATE: Entered STN: 22 Nov 1996
Last Updated on STN: 22 Nov 1996

=> d his

(FILE 'HOME' ENTERED AT 14:22:14 ON 12 MAY 2004)

FILE 'MEDLINE, USPATFULL, DGENE, EMBASE, WPIDS, BIOSIS' ENTERED AT
14:22:36 ON 12 MAY 2004

L1 181 S RS-AFP2
L2 19 S L1 AND HYDROPHOBIC RESIDUE
L3 19 S L2 AND BASIC RESIDUE
E BROEKAERT, W/AU
L4 1 S E1
L5 1 S E2

=> s antifungal protein
L6 2725 ANTIFUNGAL PROTEIN

=> s l6 and l1
L7 113 L6 AND L1

=> s l7 and l4
L8 0 L7 AND L4

=> s l7 and DNA encoding protein
3 FILES SEARCHED...
L9 0 L7 AND DNA ENCODING PROTEIN

=> d l7 ti abs ibib 1-10

L7 ANSWER 1 OF 113 MEDLINE on STN
TI The three-dimensional solution structure of NaD1, a new floral defensin from *Nicotiana alata* and its application to a homology model of the crop defense protein alfAFP.
AB NMR spectroscopy and simulated annealing calculations have been used to determine the three-dimensional structure of NaD1, a novel antifungal and insecticidal protein isolated from the flowers of *Nicotiana alata*. NaD1 is a basic, cysteine-rich protein of 47 residues and is the first example of a plant defensin from flowers to be characterized structurally. Its three-dimensional structure consists of an alpha-helix and a triple-stranded antiparallel beta-sheet that are stabilized by four intramolecular disulfide bonds. NaD1 features all the characteristics of the cysteine-stabilized alphabeta motif that has been described for a variety of proteins of differing functions ranging from antibacterial insect defensins and ion channel-perturbing scorpion toxins to an elicitor of the sweet taste response. The protein is biologically active against insect pests, which makes it a potential candidate for use in crop protection. NaD1 shares 31% sequence identity with alfAFP, an **antifungal protein** from alfalfa that confers resistance to a fungal pathogen in transgenic potatoes. The structure of NaD1 was used to obtain a homology model of alfAFP, since NaD1 has the highest level of sequence identity with alfAFP of any structurally characterized antifungal defensin. The structures of NaD1 and alfAFP were used in conjunction with structure-activity data for the radish defensin **Rs-AFP2** to provide an insight into structure-function relationships. In particular, a putative effector site was identified in the structure of NaD1 and in the corresponding homology model of alfAFP.

ACCESSION NUMBER: 2002711506 MEDLINE

DOCUMENT NUMBER: PubMed ID: 12473460

TITLE: The three-dimensional solution structure of NaD1, a new floral defensin from *Nicotiana alata* and its application to a homology model of the crop defense protein alfAFP.

AUTHOR: Lay Fung T; Schirra Horst Joachim; Scanlon Martin J;
Anderson Marilyn A; Craik David J
CORPORATE SOURCE: Department of Biochemistry, La Trobe University, Bundoora,
Victoria 3086, Australia.
SOURCE: Journal of molecular biology, (2003 Jan 3) 325 (1) 175-88.
Journal code: 2985088R. ISSN: 0022-2836.
PUB. COUNTRY: England: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: PDB-1H3R; PDB-1MR4
ENTRY MONTH: 200301
ENTRY DATE: Entered STN: 20021217
Last Updated on STN: 20030125
Entered Medline: 20030124

L7 ANSWER 2 OF 113 MEDLINE on STN

TI Synthetic peptides derived from the beta2-beta3 loop of *Raphanus sativus*
antifungal protein 2 that mimic the active site.

AB Rs-AFPs are antifungal proteins, isolated from radish (*Raphanus sativus*)
seed or leaves, which consist of 50 or 51 amino acids and belong to the
plant defensin family of proteins. Four highly homologous Rs-AFPs have
been isolated (Rs-AFP1-4). The structure of Rs-AFP1 consists of three
beta-strands and an alpha-helix, and is stabilized by four cystine
bridges. Small peptides deduced from the native sequence, still having
biological activity, are not only important tools to study
structure-function relationships, but may also constitute a commercially
interesting target. In an earlier study, we showed that the antifungal
activity of **Rs-AFP2** is concentrated mainly in the
beta2-beta3 loop. In this study, we synthesized linear 19-mer peptides,
spanning the entire beta2-beta3 loop, that were found to be almost as
potent as **Rs-AFP2**. Cysteines, highly conserved in the
native protein, are essential for maintaining the secondary structure of
the protein. Surprisingly, in the 19-mer loop peptides, cysteines can be
replaced by alpha-aminobutyric acid, which even improves the antifungal
potency of the peptides. Analogous cyclic 19-mer peptides, forced to
adopt a hairpin structure by the introduction of one or two non-native
disulfide bridges, were also found to possess high antifungal activity.
The synthetic 19-mer peptides, like **Rs-AFP2** itself,
cause increased Ca²⁺ influx in pregerminated fungal hyphae.

ACCESSION NUMBER: 2001317111 MEDLINE

DOCUMENT NUMBER: PubMed ID: 11350601

TITLE: Synthetic peptides derived from the beta2-beta3 loop of
Raphanus sativus **antifungal protein 2**
that mimic the active site.

AUTHOR: Schaaper W M; Posthuma G A; Plasman H H; Sijtsma L; Fant F;
Borremans F A; Thevissen K; Broekaert W F; Meloen R H; van
Amerongen A

CORPORATE SOURCE: Institute for Animal Science and Health (ID-Lelystad),
Lelystad, The Netherlands.. w.m.m.schaaper@id.wag-ur.nl

SOURCE: journal of peptide research : official journal of the
American Peptide Society, (2001 May) 57 (5) 409-18.
Journal code: 9707067. ISSN: 1397-002X.

PUB. COUNTRY: Denmark

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English

FILE SEGMENT: Priority Journals

ENTRY MONTH: 200108

ENTRY DATE: Entered STN: 20010827

Last Updated on STN: 20010827

Entered Medline: 20010823

L7 ANSWER 3 OF 113 MEDLINE on STN

TI The active site of drosomycin, a small insect **antifungal**

protein, delineated by comparison with the modeled structure of **Rs-AFP2**, a plant **antifungal protein**.

AB Drosomycin is the first strictly **antifungal protein** isolated from an insect (*Drosophila melanogaster*). The solution structure of this 44-residue protein has been reported previously. It involves a three-stranded beta-sheet and an alpha-helix, the protein global fold being maintained by four disulfide bridges. **Rs-AFP2** is a plant **antifungal protein** exhibiting 41% sequence similarity with drosomycin. Mutational analysis of **Rs-AFP2** showed the importance of some residues in the antifungal activity of the protein against the fungus target. In order to determine the structural features responsible for antifungal activity in both drosomycin and **Rs-AFP2**, we modeled the three-dimensional structure of **Rs-AFP2**, and of other antifungal proteins, using the solution structure of drosomycin as a template. Structure analysis of drosomycin and **Rs-AFP2**, and comparisons with the other modeled antifungal structures, revealed that the two proteins shared a hydrophobic cluster located at the protein surface in which a lysine residue is embedded. Based on these close structural similarities and the experimental data available for **Rs-AFP2** mutants, an antifungal active site of the insect protein is proposed.

ACCESSION NUMBER: 2001120999 MEDLINE
DOCUMENT NUMBER: PubMed ID: 11083062
TITLE: The active site of drosomycin, a small insect **antifungal protein**, delineated by comparison with the modeled structure of **Rs-AFP2**, a plant **antifungal protein**
AUTHOR: Landon C; Pajon A; Vovelle F; Sodano P
CORPORATE SOURCE: Centre de Biophysique Moleculaire, CNRS-UPR 4301, Orleans University, France.
SOURCE: journal of peptide research : official journal of the American Peptide Society, (2000 Oct) 56 (4) 231-8.
Journal code: 9707067. ISSN: 1397-002X.
PUB. COUNTRY: Denmark
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200102
ENTRY DATE: Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20010215

L7 ANSWER 4 OF 113 MEDLINE on STN

TI Antifungal activity of synthetic 15-mer peptides based on the **Rs-AFP2** (*Raphanus sativus* **antifungal protein** 2) sequence.

AB Plant defensins are a class of cysteine-rich peptides of which several members have been shown to be potent inhibitors of fungal growth. A series of overlapping 15-mer peptides based on the amino acid sequence of the radish **antifungal protein Rs-AFP2** have been synthesized. Peptides 6, 7, 8 and 9, comprising the region from cysteine 27 to cysteine 47 of **Rs-AFP2** showed substantial antifungal activity against several fungal species (minimal inhibitory concentrations of 30-60 micrograms/mL), but no activity towards bacteria (except peptide 6 at 100 micrograms/mL). The active peptides were shown to be sensitive to the presence of cations in the medium and to the composition and pH of the medium. When present at a subinhibitory concentration (20 micrograms/mL), peptides 1, 7, 8 and 10 potentiated the activity of **Rs-AFP2** from 2.3-fold to 2.8-fold. By mapping the characteristics of the active peptide on the structure of **Rs-AFP2** as determined by nuclear magnetic resonance, the active region of the **antifungal protein**

appears to involve beta-strands 2 and 3 in combination with the loop connecting those strands. A cyclized synthetic mimic of the loop, cysteine 36 to cysteine 45, was shown to have antifungal activity. Substitution of tyrosine 38 by alanine in the cyclic peptide substantially reduced the antifungal activity, indicating the importance of this residue for the activity of **Rs-AFP2** as demonstrated carrier by mutational analysis.

ACCESSION NUMBER: 97200483 MEDLINE
DOCUMENT NUMBER: PubMed ID: 9048418
TITLE: Antifungal activity of synthetic 15-mer peptides based on the **Rs-AFP2** (*Raphanus sativus* antifungal protein 2) sequence.
AUTHOR: De Samblanx G W; Fernandez del Carmen A; Sijtsma L; Plasman H H; Schaaper W M; Posthuma G A; Fant F; Meloen R H; Broekaert W F; van Amerongen A
CORPORATE SOURCE: Katholieke Universiteit Leuven, Heverlee, Belgium.
SOURCE: Peptide research, (1996 Nov-Dec) 9 (6) 262-8.
Journal code: 8913494. ISSN: 1040-5704.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199706
ENTRY DATE: Entered STN: 19970620
Last Updated on STN: 19970620
Entered Medline: 19970610

L7 ANSWER 5 OF 113 MEDLINE on STN

TI Small cysteine-rich antifungal proteins from radish: their role in host defense.

AB Radish seeds have previously been shown to contain two homologous, 5-kD cysteine-rich proteins designated *Raphanus sativus*-**antifungal protein 1** (**Rs-AFP1**) and **Rs-AFP2**, both of which exhibit potent antifungal activity in vitro. We now demonstrate that these proteins are located in the cell wall and occur predominantly in the outer cell layers lining different seed organs. Moreover, **Rs-AFPs** are preferentially released during seed germination after disruption of the seed coat. The amount of released proteins is sufficient to create a microenvironment around the seed in which fungal growth is suppressed. Both the cDNAs and the intron-containing genomic regions encoding the **Rs-AFP** preproteins were cloned. Transcripts (0.55 kb) hybridizing with an **Rs-AFP1** cDNA-derived probe were present in near-mature and mature seeds. Such transcripts as well as the corresponding proteins were barely detectable in healthy uninfected leaves but accumulated systemically at high levels after localized fungal infection. The induced leaf proteins (designated **Rs-AFP3** and **Rs-AFP4**) were purified and shown to be homologous to seed **Rs-AFPs** and to exert similar antifungal activity in vitro. A chimeric **Rs-AFP2** gene under the control of the constitutive cauliflower mosaic virus 35S promoter conferred enhanced resistance to the foliar pathogen *Alternaria longipes* in transgenic tobacco. The term "plant defensins" is proposed to denote these defense-related proteins.

ACCESSION NUMBER: 95299350 MEDLINE
DOCUMENT NUMBER: PubMed ID: 7780308
TITLE: Small cysteine-rich antifungal proteins from radish: their role in host defense.
AUTHOR: Terras F R; Eggermont K; Kovaleva V; Raikhel N V; Osborn R W; Kester A; Rees S B; Torrekens S; Van Leuven F; Vanderleyden J; +
CORPORATE SOURCE: F.A. Janssens Laboratory of Genetics, Katholieke Universiteit Leuven, Heverlee, Belgium.
SOURCE: Plant cell, (1995 May) 7 (5) 573-88.
Journal code: 9208688. ISSN: 1040-4651.
PUB. COUNTRY: United States

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-U18556; GENBANK-U18557
ENTRY MONTH: 199507
ENTRY DATE: Entered STN: 19950726
Last Updated on STN: 19950726
Entered Medline: 19950719

L7 ANSWER 6 OF 113 MEDLINE on STN
TI Expression of functional *Raphanus sativus* **antifungal protein** in yeast.
AB **Rs-AFP2** is a 51 amino acid cysteine-rich peptide isolated from radish (*Raphanus sativus*) seeds that exhibits potent inhibitory activity against filamentous fungi. A cDNA clone encoding the **Rs-AFP2** preprotein was modified by recombinant DNA methods to allow expression in the yeast *Saccharomyces cerevisiae*. This peptide was expressed in yeast as a fusion protein carrying at its N-terminus the prepro-sequences derived from the precursor of the yeast pheromone mating factor alpha 1. These sequences allow secretion of the biologically active peptide in a correctly processed form. Deletion of the mating factor alpha 1 pro-peptide drastically reduced the expression level of the peptide.

ACCESSION NUMBER: 94307430 MEDLINE
DOCUMENT NUMBER: PubMed ID: 8034047
TITLE: Expression of functional *Raphanus sativus* **antifungal protein** in yeast.
AUTHOR: Alves A L; De Samblanx G W; Terras F R; Cammue B P; Broekaert W F
CORPORATE SOURCE: F.A. Janssens Laboratory of Genetics, Catholic University of Leuven, Heverlee, Belgium.
SOURCE: FEBS letters, (1994 Jul 18) 348 (3) 228-32.
Journal code: 0155157. ISSN: 0014-5793.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199408
ENTRY DATE: Entered STN: 19940825
Last Updated on STN: 19940825
Entered Medline: 19940817

L7 ANSWER 7 OF 113 USPATFULL on STN
TI Antifungal polypeptide and methods for controlling plant pathogenic fungi
AB An antifungal polypeptide, AlyAFP, that controls fungal damage to plants is provided. DNA encoding this polypeptide can be cloned into vectors for transformation of plant-colonizing microorganisms or plants, thereby providing a method of inhibiting fungal growth on plants. The polypeptide can be formulated into compositions that can be used to control undesired fungi on plants and elsewhere.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2004:84393 USPATFULL
TITLE: Antifungal polypeptide and methods for controlling plant pathogenic fungi
INVENTOR(S): Liang, Jihong, Chesterfield, MO, UNITED STATES
Shah, Dilip Maganlal, Chesterfield, MO, UNITED STATES
Wu, Yonnie Shun, Chesterfield, MO, UNITED STATES
Rosenberger, Cindy Annette, Ballwin, MO, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004064850	A1	20040401

APPLICATION INFO.: US 2003-681972 A1 20031009 (10)
 RELATED APPLN. INFO.: Division of Ser. No. US 2001-829381, filed on 9 Apr 2001, GRANTED, Pat. No. US 6653280 Division of Ser. No. US 1998-103489, filed on 24 Jun 1998, GRANTED, Pat. No. US 6215048 Division of Ser. No. US 1996-627706, filed on 29 Mar 1996, GRANTED, Pat. No. US 5773696

DOCUMENT TYPE: Utility
 FILE SEGMENT: APPLICATION
 LEGAL REPRESENTATIVE: MONSANTO COMPANY, 800 N. LINDBERGH BLVD., ATTENTION: G.P. WUELLNER, IP PARALEGAL, (E2NA), ST. LOUIS, MO, 63167

NUMBER OF CLAIMS: 28
 EXEMPLARY CLAIM: 1
 NUMBER OF DRAWINGS: 12 Drawing Page(s)
 LINE COUNT: 1991
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 8 OF 113 USPATFULL on STN
 TI DNA sequences encoding antifungal proteins
 AB The present invention provides DNA sequences encoding antifungal peptides which comprise at least six amino acid residues identical to a run of amino acid residues found between position 21 and position 51 of the **Rs-AFP2 antifungal protein** sequence (SEQ ID NO: 35) or a substantially homologous protein. The peptides are useful for combating fungal diseases in agriculture, pharmaceutical or preservative applications

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:320416 USPATFULL
 TITLE: DNA sequences encoding antifungal proteins
 INVENTOR(S): Amerongen, Aart Van, Veenendaal, NETHERLANDS
 Fant, Franky, Wetteren, BELGIUM
 Borremans, Frans Alois Melania, Destelbergen, BELGIUM
 De Samblanx, Genoveva Wivina, Heverlee, BELGIUM
 Sijtsma, Lolke, Renkum, NETHERLANDS
 Meloen, Robbert Hans, Lelystad, NETHERLANDS
 Puijk, Wouter Cornelis, Lelystad, NETHERLANDS
 Schaaper, Wilhelmus Martinus Maria, Almere, NETHERLANDS
 Broekaert, Willem Frans, Dilbeek, BELGIUM
 Gelder, Wilhelmus Martinus Jozef Van, Zoetermeer, NETHERLANDS
 Rees, Sarah Bronwen, Bracknell, UNITED KINGDOM

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003226169	A1	20031204
APPLICATION INFO.:	US 2003-388361	A1	20030313 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 1998-77948, filed on 7 Aug 1998, GRANTED, Pat. No. US 6605698 A 371 of International Ser. No. WO 1996-GB3068, filed on 12 Dec 1996, UNKNOWN		

	NUMBER	DATE
PRIORITY INFORMATION:	GB 1995-25455	19951213
	GB 1996-6552	19960328
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	SYNGENTA BIOTECHNOLOGY, INC., PATENT DEPARTMENT, 3054 CORNWALLIS ROAD, P.O. BOX 12257, RESEARCH TRIANGLE PARK, NC, 27709-2257	
NUMBER OF CLAIMS:	18	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	23 Drawing Page(s)	

LINE COUNT: 3010
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 9 OF 113 USPATFULL on STN

TI Plant-derived molecules and genetic sequences encoding same and uses therefor

AB The present invention provides genetic molecules encoding plant floral defensin-like molecules and their use in generating transgenic plants having resistance or at least reduced sensitivity to plant pests including insects, microorganisms, fungi and/or viruses. The present invention further provides for the use of floral- and seed-derived defensins in the generation of insect resistance in plants. The plants may be monocotyledonous or dicotyledonous plants and are in particular, crop plants and ornamental flowering plants. The genetic molecules are also useful in generating recombinant defensin-like molecules for use in the topical application of compositions to prevent or otherwise retard pest-infestation of plants. The floral defensin-like molecules or genetic molecules encoding same of the present invention may be used alone or in combination with other agents such as a proteinase inhibitor precursor or a nucleic acid molecule encoding same or other molecules or their encoding nucleotide sequences.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:307946 USPATFULL

TITLE: Plant-derived molecules and genetic sequences encoding same and uses therefor

INVENTOR(S): Anderson, Marilyn Anne, Keilor, AUSTRALIA
Lay, Fung Tso, Reservoir, AUSTRALIA
Heath, Robyn Louise, Clifton Hill, AUSTRALIA

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003217382	A1	20031120
APPLICATION INFO.:	US 2002-72809	A1	20020208 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2001-267271P	20010208 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	GREENLEE WINNER AND SULLIVAN P C, 5370 MANHATTAN CIRCLE, SUITE 201, BOULDER, CO, 80303	
NUMBER OF CLAIMS:	54	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	20 Drawing Page(s)	
LINE COUNT:	3811	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 10 OF 113 USPATFULL on STN

TI Antifungal peptides and composition thereof

AB Antifungal peptides which comprise at least six amino acid residues identical to a run of amino acid residues found between position 21 and position 51 of the **R_s-AFP2 antifungal protein** sequence or of substantially homologous protein sequences. The peptides are useful for combating fungal diseases in agricultural, pharmaceutical or preservative applications.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:216221 USPATFULL

TITLE: Antifungal peptides and composition thereof

INVENTOR(S): Van Amerongen, Aart, Veenendaal, NETHERLANDS
Fant, Franky, Wetteren, BELGIUM
Borremans, Frans Alois, Destelbergen, BELGIUM
De Samblanx, Genoveva Wivina, Heverlee, BELGIUM

Sijtsma, Lolke, Renkum, NETHERLANDS
 Meloen, Robbert Hans, Lelystad, NETHERLANDS
 Puijk, Wouter Cornelis, Lelystad, NETHERLANDS
 Schaaper, Wilhelmus Martinus Maria, Almere, NETHERLANDS
 Broekaert, Willem Frans, Dilbeek, BELGIUM
 van Gelder, Wilhelmus Martinus Josef, Zoetermeer,
 NETHERLANDS
 Rees, Sarah Bronwen, Bracknell, UNITED KINGDOM
 Syngenta Limited, Guildford, UNITED KINGDOM (non-U.S.
 corporation)

PATENT ASSIGNEE(S):

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6605698	B1	20030812
	WO 9721815		19970619
APPLICATION INFO.:	US 1998-77948		19980807 (9)
	WO 1996-GB3068		19961212

	NUMBER	DATE
PRIORITY INFORMATION:	GB 1995-25455	19951213
	GB 1996-6552	19960328
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Low, Christopher S. F.	
ASSISTANT EXAMINER:	Robinson, Hope A.	
LEGAL REPRESENTATIVE:	Hale & Dorr, Syngenta Limited	
NUMBER OF CLAIMS:	8	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	43 Drawing Figure(s); 23 Drawing Page(s)	
LINE COUNT:	1765	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

Hit List

6605698

Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs
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Search Results - Record(s) 1 through 10 of 10 returned.

☐ 1. Document ID: US 6605698 B1

L14: Entry 1 of 10

File: USPT

Aug 12, 2003

US-PAT-NO: 6605698

DOCUMENT-IDENTIFIER: US 6605698 B1

TITLE: Antifungal peptides and composition thereof

DATE-ISSUED: August 12, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Van Amerongen; Aart	Veenendaal			NL
Fant; Franky	Wetteren			BE
Borremans; Frans Alois	Destelbergen			BE
De Samblanx; Genoveva Wivina	Heverlee			BE
Sijtsma; Lolke	Renkum			NL
Meloen; Robbert Hans	Lelystad			NL
Puijk; Wouter Cornelis	Lelystad			NL
Schaaper; Wilhelmus Martinus Maria	Almere			NL
Broekaert; Willem Frans	Dilbeek			BE
van Gelder; Wilhelmus Martinus Josef	Zoetermeer			NL
Rees; Sarah Bronwen	Bracknell			GB

US-CL-CURRENT: 530/350; 435/252.3, 435/252.33, 435/320.1, 435/410, 435/419,
435/430, 435/69.1, 530/300, 536/23.6, 536/24.3, 800/278, 800/280, 800/281, 800/290,
800/294

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Draw D
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☐ 2. Document ID: US 6521590 B1

L14: Entry 2 of 10

File: USPT

Feb 18, 2003

US-PAT-NO: 6521590

DOCUMENT-IDENTIFIER: US 6521590 B1

TITLE: Biocidal proteins

DATE-ISSUED: February 18, 2003

h e b b g e e e f e c e c e e f b e

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Broekaert; Willem Frans	Dilbeek			BE
Cammue; Bruno Philippe Angelo	Alsemberg			BE
Osborn; Rupert William	Twickenham			GB
Rees; Sarah Bronwen	Forest Park			GB
Vanderleyden; Jozef	Heverlee			BE

US-CL-CURRENT: 514/2; 514/16, 530/300, 530/328, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Drawings
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☐ 3. Document ID: US 6372888 B1

L14: Entry 3 of 10

File: USPT

Apr 16, 2002

US-PAT-NO: 6372888

DOCUMENT-IDENTIFIER: US 6372888 B1

TITLE: Antifungal proteins

DATE-ISSUED: April 16, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
De Samblanx; Genoveva Wivina	Heverlee			BE
Broekaert; Willem Frans	Dilbeek			BE
Rees; Sarah Bronwen	Bracknell			GB

US-CL-CURRENT: 530/350; 435/320.1, 435/419, 435/486, 435/7.2, 435/7.31, 530/300,
530/324, 536/23.6, 800/301, 800/302

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Drawings
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☐ 4. Document ID: US 6150588 A

L14: Entry 4 of 10

File: USPT

Nov 21, 2000

US-PAT-NO: 6150588

DOCUMENT-IDENTIFIER: US 6150588 A

TITLE: DNA encoding antimicrobial proteins from impatiens

DATE-ISSUED: November 21, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Attenborough; Sheila	Maidenhead			GB
Broekaert; Willem Frans	Dilbeek			BE

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Osborn; Rupert William	Twickenham	GB
Ray; John Anthony	Bracknell	GB
Rees; Sarah <u>Bronwen</u>	Bracknell	GB
Tailor; Ravindra Haribhai	Bracknell	GB

US-CL-CURRENT: 800/298; 435/252.3, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 5. Document ID: US 5986176 A

L14: Entry 5 of 10

File: USPT

Nov 16, 1999

US-PAT-NO: 5986176

DOCUMENT-IDENTIFIER: US 5986176 A

TITLE: Transgenic plants expressing biocidal proteins

DATE-ISSUED: November 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Broekaert</u> ; Willem Frans	Dilbeek			BE
Cammue; Bruno Phillippe Angelo	Alsemberg			BE
Rees; Sarah <u>Bronwen</u>	Forest Park			GB
Vanderleyden; Jozef	Heverlee			BE

US-CL-CURRENT: 800/301; 800/298

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 6. Document ID: US 5942663 A

L14: Entry 6 of 10

File: USPT

Aug 24, 1999

US-PAT-NO: 5942663

DOCUMENT-IDENTIFIER: US 5942663 A

TITLE: Biocidal proteins

DATE-ISSUED: August 24, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>De Bolle</u> ; Miguel	Leuven			BE
<u>Broekaert</u> ; Willem Frans	Dilbeek			BE
Cammue; Bruno Phillippe Angelo	Alsemberg			BE
Rees; Sarah <u>Bronwen</u>	Bracknell			GB
Vanderleyden; Jozef	Heverlee			BE

US-CL-CURRENT: 800/301; 435/252.3, 536/23.6, 800/279

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawings
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☐ 7. Document ID: US 5861480 A

L14: Entry 7 of 10

File: USPT

Jan 19, 1999

US-PAT-NO: 5861480

DOCUMENT-IDENTIFIER: US 5861480 A

TITLE: Antimicrobial proteins from aralia and impatiens

DATE-ISSUED: January 19, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Attenborough; Shelia	Maidenhead			GB
<u>Broekaert</u> ; Willem Frans	Dilbeek			BE
Osborn; Rupert William	Twickenham			GB
Ray; John Anthony	Bracknell			GB
Rees; Sarah <u>Bronwen</u>	Bracknell			GB
Taylor; Ravindra Haribhai	Bracknell			GB

US-CL-CURRENT: 530/326; 435/252.3, 435/252.33, 435/320.1, 435/410, 435/419,
530/300, 530/350, 536/23.1, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawings
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☐ 8. Document ID: US 5773694 A

L14: Entry 8 of 10

File: USPT

Jun 30, 1998

US-PAT-NO: 5773694

DOCUMENT-IDENTIFIER: US 5773694 A

TITLE: Antimicrobial proteins from Allium

DATE-ISSUED: June 30, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Broekaert</u> ; Willem Frans	Dilbeek			BE
Cammue; Bruno Philippe Angelo	Alsemberg			BE
Rees; Sarah <u>Bronwen</u>	Bracknell			GB2

US-CL-CURRENT: 800/301; 435/252.3, 435/254.11, 514/12, 530/324, 530/370, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawings
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☐ 9. Document ID: US 5691199 A

L14: Entry 9 of 10

File: USPT

Nov 25, 1997

US-PAT-NO: 5691199

DOCUMENT-IDENTIFIER: US 5691199 A

TITLE: DNA encoding biocidal proteins

DATE-ISSUED: November 25, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Broekaert</u> ; Willem Frans	Dilbeek			BE
Cammue; Bruno Philippe Angelo	Alsemberg			BE
Rees; Sarah <u>Bronwen</u>	Berkshire			GB2
Vanderleyden; Jozef	Heverlee			BE

US-CL-CURRENT: 435/325; 435/252.3, 530/324, 530/379, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw De
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☐ 10. Document ID: US 5689048 A

L14: Entry 10 of 10

File: USPT

Nov 18, 1997

US-PAT-NO: 5689048

DOCUMENT-IDENTIFIER: US 5689048 A

TITLE: Biocidal proteins

DATE-ISSUED: November 18, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>De Bolle</u> ; Miguel	Louvain			BE
<u>Broekaert</u> ; Willem Frans	Dilbeek			BE
Cammue; Bruno Philippe Angelo	Alsemberg			BE
Rees; Sarah <u>Bronwen</u>	Bracknell			GB
Vanderleyden; Jozef	Heverlee			BE

US-CL-CURRENT: 800/301; 435/252.3, 435/320.1, 435/69.1, 435/70.1, 435/71.1,
435/71.3, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw De
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☐ 1. Document ID: US 6653280 B2

L3: Entry 1 of 20

File: USPT

Nov 25, 2003

US-PAT-NO: 6653280

DOCUMENT-IDENTIFIER: US 6653280 B2

TITLE: Antifungal polypeptide AlyAFP from Alyssum and methods for controlling plant pathogenic fungi

DATE-ISSUED: November 25, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liang; Jihong	Chesterfield	MO		
Shah; Dilip Maganlal	Chesterfield	MO		
Wu; Yonnie Shun	Chesterfield	MO		
Rosenberger; Cindy Annette	Ballwin	MO		

US-CL-CURRENT: 514/2; 424/404, 514/12, 530/324, 530/370

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw Ds
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☐ 2. Document ID: US 6605698 B1

L3: Entry 2 of 20

File: USPT

Aug 12, 2003

US-PAT-NO: 6605698

DOCUMENT-IDENTIFIER: US 6605698 B1

TITLE: Antifungal peptides and composition thereof

DATE-ISSUED: August 12, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Van Amerongen; Aart	Veenendaal			NL
Fant; Franky	Wetteren			BE
Borremans; Frans Alois	Destelbergen			BE
De Samblanx; Genoveva Wivina	Heverlee			BE
Sijtsma; Lolke	Renkum			NL

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Meloen; Robbert Hans	Lelystad	NL
Puijk; Wouter Cornelis	Lelystad	NL
Schaaper; Wilhelmus Martinus Maria	Almere	NL
Broekaert; Willem Frans	Dilbeek	BE
van Gelder; Wilhelmus Martinus Josef	Zoetermeer	NL
Rees; Sarah Bronwen	Bracknell	GB

US-CL-CURRENT: 530/350; 435/252.3, 435/252.33, 435/320.1, 435/410, 435/419,
435/430, 435/69.1, 530/300, 536/23.6, 536/24.3, 800/278, 800/280, 800/281, 800/290,
800/294

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWMC	Drawings
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☐ 3. Document ID: US 6599514 B1

L3: Entry 3 of 20

File: USPT

Jul 29, 2003

US-PAT-NO: 6599514

DOCUMENT-IDENTIFIER: US 6599514 B1

TITLE: Antifungal composition

DATE-ISSUED: July 29, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Greenland; Andrew James	Bracknell			GB
Fuentes Mateos; Angel Manuel	Bracknell			GB

US-CL-CURRENT: 424/404; 424/439, 424/725, 424/755, 424/776, 435/69.1, 530/350,
530/370

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWMC	Drawings
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☐ 4. Document ID: US 6528703 B1

L3: Entry 4 of 20

File: USPT

Mar 4, 2003

US-PAT-NO: 6528703

DOCUMENT-IDENTIFIER: US 6528703 B1

TITLE: Production of transgenic impatiens

DATE-ISSUED: March 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chou; Tau-San	Batavia	IL		

US-CL-CURRENT: 800/278; 435/200, 435/209, 435/430, 435/431, 435/468, 435/469,

435/470, 435/69.1, 800/280, 800/281, 800/282, 800/283, 800/285, 800/286, 800/288,
800/290, 800/293, 800/294, 800/302, 800/323

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Drawings
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☐ 5. Document ID: US 6372888 B1

L3: Entry 5 of 20

File: USPT

Apr 16, 2002

US-PAT-NO: 6372888

DOCUMENT-IDENTIFIER: US 6372888 B1

TITLE: Antifungal proteins

DATE-ISSUED: April 16, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
De Samblanx; Genoveva Wivina	Heverlee			BE
Broekaert; Willem Frans	Dilbeek			BE
Rees; Sarah Bronwen	Bracknell			GB

US-CL-CURRENT: 530/350; 435/320.1, 435/419, 435/486, 435/7.2, 435/7.31, 530/300,
530/324, 536/23.6, 800/301, 800/302

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Drawings
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☐ 6. Document ID: US 6329504 B1

L3: Entry 6 of 20

File: USPT

Dec 11, 2001

US-PAT-NO: 6329504

DOCUMENT-IDENTIFIER: US 6329504 B1

TITLE: Antifungal polypeptide and methods for controlling plant pathogenic fungi

DATE-ISSUED: December 11, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liang; Jihong	Chesterfield	MO		
Shah; Dilip Maganlal	Chesterfield	MO		
Wu; Yonnie S.	Wildwood	MO		
Rosenberger; Cindy A.	Ballwin	MO		
Hakimi; Salim	Chesterfield	MO		

US-CL-CURRENT: 530/350; 435/418, 435/419, 435/468, 435/69.1, 435/70.1, 530/324,
530/325, 530/326, 536/23.1, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Drawings
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☐ 7. Document ID: US 6316407 B1

L3: Entry 7 of 20

File: USPT

Nov 13, 2001

US-PAT-NO: 6316407

DOCUMENT-IDENTIFIER: US 6316407 B1

TITLE: Antifungal polypeptide from alfalfa and methods for controlling plant pathogenic fungi

DATE-ISSUED: November 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liang; Jihong	Chesterfield	MO		
Shah; Dilip Maganlal	Chesterfield	MO		
Wu; Yonnie S.	Wildwood	MO		
Rosenberger; Cindy A.	Ballwin	MO		
Hakimi; Salim	Chesterfield	MO		

US-CL-CURRENT: 514/12; 530/324

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 8. Document ID: US 6215048 B1

L3: Entry 8 of 20

File: USPT

Apr 10, 2001

US-PAT-NO: 6215048

DOCUMENT-IDENTIFIER: US 6215048 B1

TITLE: Nucleic acid sequences encoding an antifungal polypeptide, aly AFP from alyssum and methods for their use

DATE-ISSUED: April 10, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liang; Jihong	Chesterfield	MO		
Shah; Dilip Maganlal	Chesterfield	MO		
Wu; Yonnie Shun	Chesterfield	MO		
Rosenberger; Cindy Annette	Ballwin	MO		

US-CL-CURRENT: 800/317.2; 435/320.1, 536/23.6, 800/279, 800/301, 800/302

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 9. Document ID: US 6187904 B1

L3: Entry 9 of 20

File: USPT

Feb 13, 2001

US-PAT-NO: 6187904

DOCUMENT-IDENTIFIER: US 6187904 B1

TITLE: Biocidal proteins

DATE-ISSUED: February 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Broekaert; Willem F.	Dilbeek			BE
Cammue; Bruno P. A.	Alsemberg			BE
Osborn; Rupert W.	Middlesex			GB
Rees; Sarah B.	Berkshire			GB
Terras; Franky R. G.	Amzegem			BE
Vanderleyden; Jozef	Heverlee			BE

US-CL-CURRENT: 530/324; 530/326, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 10. Document ID: US 6150588 A

L3: Entry 10 of 20

File: USPT

Nov 21, 2000

US-PAT-NO: 6150588

DOCUMENT-IDENTIFIER: US 6150588 A

TITLE: DNA encoding antimicrobial proteins from impatiens

DATE-ISSUED: November 21, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Attenborough; Sheila	Maidenhead			GB
Broekaert; Willem Frans	Dilbeek			BE
Osborn; Rupert William	Twickenham			GB
Ray; John Anthony	Bracknell			GB
Rees; Sarah Bronwen	Bracknell			GB
Taylor; Ravindra Haribhai	Bracknell			GB

US-CL-CURRENT: 800/298; 435/252.3, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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Search Results - Record(s) 11 through 20 of 20 returned.

☐ 11. Document ID: US 6121511 A

L3: Entry 11 of 20

File: USPT

Sep 19, 2000

US-PAT-NO: 6121511

DOCUMENT-IDENTIFIER: US 6121511 A

**** See image for Certificate of Correction ****

TITLE: Production of transgenic impatiens

DATE-ISSUED: September 19, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chou; Tau-San	Batavia	IL		

US-CL-CURRENT: 800/294; 435/418, 435/419, 435/430, 435/431, 435/69.1, 800/278,
800/280, 800/281, 800/282, 800/283, 800/285, 800/286, 800/288, 800/290, 800/301,
800/302, 800/323

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 12. Document ID: US 6121436 A

L3: Entry 12 of 20

File: USPT

Sep 19, 2000

US-PAT-NO: 6121436

DOCUMENT-IDENTIFIER: US 6121436 A

TITLE: Antifungal polypeptide and methods for controlling plant pathogenic fungi

DATE-ISSUED: September 19, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liang; Jihong	Chesterfield	MO		
Shah; Dilip Maganlal	Chesterfield	MO		
Wu; Yonnie S.	Wildwood	MO		
Rosenberger; Cindy A.	Ballwin	MO		
Hakimi; Salim	Chesterfield	MO		

US-CL-CURRENT: 536/23.6; 536/24.3

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. Data
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☐ 13. Document ID: US 5919918 A

L3: Entry 13 of 20

File: USPT

Jul 6, 1999

US-PAT-NO: 5919918

DOCUMENT-IDENTIFIER: US 5919918 A

TITLE: Transformed plants expressing antimicrobial proteins

DATE-ISSUED: July 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Broekaert; Willem Frans	Dilbeek			BE
Cammue; Bruno Philippe Angelo	Alsemberg			BE
Osborn; Rupert William	Middlesex			GB
Rees; Sarah Bronwen	Bracknell			GB

US-CL-CURRENT: 536/23.6; 435/252.3, 435/69.1, 800/278

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. Data
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☐ 14. Document ID: US 5861480 A

L3: Entry 14 of 20

File: USPT

Jan 19, 1999

US-PAT-NO: 5861480

DOCUMENT-IDENTIFIER: US 5861480 A

TITLE: Antimicrobial proteins from aralia and impatiens

DATE-ISSUED: January 19, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Attenborough; Shelia	Maidenhead			GB
Broekaert; Willem Frans	Dilbeek			BE
Osborn; Rupert William	Twickenham			GB
Ray; John Anthony	Bracknell			GB
Rees; Sarah Bronwen	Bracknell			GB
Taylor; Ravindra Haribhai	Bracknell			GB

US-CL-CURRENT: 530/326; 435/252.3, 435/252.33, 435/320.1, 435/410, 435/419,
530/300, 530/350, 536/23.1, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Drawings
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☐ 15. Document ID: US 5824869 A

L3: Entry 15 of 20

File: USPT

Oct 20, 1998

US-PAT-NO: 5824869

DOCUMENT-IDENTIFIER: US 5824869 A

TITLE: Biocidal proteins

DATE-ISSUED: October 20, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Broekaert; Willem F.	Dilbeek			BE
Cammue; Bruno P.A.	Alsemberg			BE
Osborn; Rupert W.	Middlesex			GB2
Rees; Sarah B.	Berkshire			GB2
Terras; Franky R.G.	Amzegem			BE
Vanderleyden; Jozef	Heverlee			BE

US-CL-CURRENT: 800/301; 435/418, 435/419, 435/69.1, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Drawings
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☐ 16. Document ID: US 5773696 A

L3: Entry 16 of 20

File: USPT

Jun 30, 1998

US-PAT-NO: 5773696

DOCUMENT-IDENTIFIER: US 5773696 A

TITLE: Antifungal polypeptide and methods for controlling plant pathogenic fungi

DATE-ISSUED: June 30, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liang; Jihong	Chesterfield	MO		
Shah; Dilip Maganlal	Chesterfield	MO		
Wu; Yonnie Shun	Chesterfield	MO		
Rosenberger; Cindy Annette	Ballwin	MO		

US-CL-CURRENT: 800/279; 435/320.1, 435/419, 536/23.6, 800/301, 800/302

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Drawings
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☐ 17. Document ID: US 5773694 A

L3: Entry 17 of 20

File: USPT

Jun 30, 1998

US-PAT-NO: 5773694

DOCUMENT-IDENTIFIER: US 5773694 A

TITLE: Antimicrobial proteins from Allium

DATE-ISSUED: June 30, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Broekaert; Willem Frans	Dilbeek			BE
Cammue; Bruno Philippe Angelo	Alsemberg			BE
Rees; Sarah Bronwen	Bracknell			GB2

US-CL-CURRENT: 800/301; 435/252.3, 435/254.11, 514/12, 530/324, 530/370, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KMC	Draw D
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☐ 18. Document ID: US 5750504 A

L3: Entry 18 of 20

File: USPT

May 12, 1998

US-PAT-NO: 5750504

DOCUMENT-IDENTIFIER: US 5750504 A

TITLE: Antimicrobial proteins

DATE-ISSUED: May 12, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Broekaert; Willem Frans	Dilbeek			BE
Cammue; Bruno Philippe Angelo	Alsemberg			BE
Osborn; Rupert William	Twickenham			GB
Rees; Sarah Bronwen	Forest Park			GB

US-CL-CURRENT: 514/12; 530/324

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KMC	Draw D
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☐ 19. Document ID: US 5689043 A

L3: Entry 19 of 20

File: USPT

Nov 18, 1997

US-PAT-NO: 5689043

DOCUMENT-IDENTIFIER: US 5689043 A

TITLE: Biocidal proteins

DATE-ISSUED: November 18, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Broekaert; Willem F.	Dilbeek			BE
Cammue; Bruno P.A.	Alsemberg			BE
Osborn; Rupert W.	Middlesex			GB2
Rees; Sarah B.	Berkshire			GB2
Terras; Franky R.G.	Amzegem			BE
Vanderleyden; Jozef	Heverlee			BE

US-CL-CURRENT: 800/301; 435/252.3, 435/320.1, 435/418, 435/419, 536/23.6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Draw De
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☐ 20. Document ID: US 5538525 A

L3: Entry 20 of 20

File: USPT

Jul 23, 1996

US-PAT-NO: 5538525

DOCUMENT-IDENTIFIER: US 5538525 A

**** See image for Certificate of Correction ****

TITLE: Biocidal proteins

DATE-ISSUED: July 23, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Broekaert; Willem F.	Dilbeek			BE
Cammue; Bruno P. A.	Alsemberg			BE
Osborn; Rupert W.	Middlesex			GB2
Rees; Sarah B.	Berkshire			GB2
Terras; Franky R. G.	Amzegem			BE
Vanderleyden; Jozef	Heverlee			BE

US-CL-CURRENT: 514/2; 514/12, 530/324

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Draw De
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 US Patents Full-Text Database
 US OCR Full-Text Database
 EPO Abstracts Database
 JPO Abstracts Database
 Derwent World Patents Index
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L12

Search History

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result set

DB=USPT; PLUR=YES; OP=OR

<u>L12</u>	L11 and L10	12	<u>L12</u>
<u>L11</u>	bronwen.in.	24	<u>L11</u>
<u>L10</u>	l8 and L9	28	<u>L10</u>
<u>L9</u>	broekaert.in.	42	<u>L9</u>
<u>L8</u>	position 9 and L7	2054912	<u>L8</u>
<u>L7</u>	basic residue and l3	559157	<u>L7</u>
<u>L6</u>	l3 and L5	20	<u>L6</u>
<u>L5</u>	L4 and hydrophobic residue	280095	<u>L5</u>
<u>L4</u>	l2 and mutation	29761	<u>L4</u>
<u>L3</u>	Rs-AFP2	20	<u>L3</u>
<u>L2</u>	antifungal protein	154536	<u>L2</u>
<u>L1</u>	5919918.pn.	1	<u>L1</u>

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Search Results -

Terms	Documents
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Database:

US Pre-Grant Publication Full-Text Database
 US Patents Full-Text Database
 US OCR Full-Text Database
 EPO Abstracts Database
 JPO Abstracts Database
 Derwent World Patents Index
 IBM Technical Disclosure Bulletins

Search:

L14

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Recall Text

Clear

Interrupt

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result set

DB=USPT; PLUR=YES; OP=OR

<u>L14</u>	L13 and l12	10	<u>L14</u>
<u>L13</u>	De Samblanx.in.	844753	<u>L13</u>
<u>L12</u>	L11 and l10	12	<u>L12</u>
<u>L11</u>	bronwen.in.	24	<u>L11</u>
<u>L10</u>	l8 and L9	28	<u>L10</u>
<u>L9</u>	broekaert.in.	42	<u>L9</u>
<u>L8</u>	position 9 and L7	2054912	<u>L8</u>
<u>L7</u>	basic residue and l3	559157	<u>L7</u>
<u>L6</u>	l3 and L5	20	<u>L6</u>
<u>L5</u>	L4 and hydrophobic residue	280095	<u>L5</u>
<u>L4</u>	l2 and mutation	29761	<u>L4</u>
<u>L3</u>	Rs-AFP2	20	<u>L3</u>
<u>L2</u>	antifungal protein	154536	<u>L2</u>
<u>L1</u>	5919918.pn.	1	<u>L1</u>

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